AMERICAN MUSEUM NOVITATES

Number 627 — Published by THE AMERICAN MUSEUM OF NATURAL HISTORY New York City — May 27, 1933

56.9 (118:52)

A LIST OF THE FOSSIL LAND MAMMALS OF JAPAN AND KOREA WITH DESCRIPTIONS OF NEW EOCENE FORMS FROM KOREA

BY SHIGEYASU TOKUNAGA

INTRODUCTION

The author has recently visited the Department of Palaeontology at the American Museum of Natural History and has had the opportunity of making comparisons between the Korean fossils briefly described in the following pages and the extensive collection of the Central Asiatic Expedition from Mongolia. He desires to express here his appreciation of the opportunity to publish in *Novitates* the first description of this Korean fauna and the list of Japanese and Korean fossil mammals as known to date.

A mammalian jaw-bone belonging to the genus *Brachyodus*, which was excavated by the author at the Oligocene coal-bed in Kyushu, is assuredly the most ancient land-mammal ever discovered in Japan proper.

A number of specimens described in this paper have been unearthed in the Eocene beds in the northwestern part of Korea. Several kinds of mammals are reported to have been excavated in the Miocene districts of Japan, among which those from Mino are especially worthy of notice.

An interesting species of *Cervavus* which lived in the Pontian age, the author is informed has been discovered in Japan and China. This proves the fact that the islands of Japan were connected with the continent during late Miocene time.

The surest evidence, however, of the land connection of Japan with China and India is given by the proboscideans found abundantly in the older Pleistocene beds of Japan. Whether the land-bridge existed in the older Holocene, still remains to be determined.

Six species of *Rhinoceros* were named provisionally as new species by the author, and their confirmatory studies are now being undertaken.

The species marked with an asterisk in the following list are those common to Japan and continental Asia:

LIST OF THE FOSSIL LAND MAMMALS OF JAPAN AND KOREA

Specific Names	Locality	Oligocene	Miocene	Pliocene	Pleistocene
PRIMATES					
Macacus fuscatus Bly	Kyushu (Buzen)				×
RODENTIA					
Sciurid	Honshu (Mino)		×		
Lepus brachyurus brachyurus Tem.	Kyushu (Buzen)				×
CARNIVORA					
Meles anakuma Tem.	Honshu (Shimotsuke), Kyushu (Buzen)				×
PROBOSCIDEA[1]					
Hemimastodon annectens Mat. (*Serridentinus*)	Honshu (Mino)		×		
**Prostegodon latidens* (Clift) (*Stegolophodon*)	Honshu (Hitachi, Rikuzen)		×		
Trilophodon sendaicus Mat. (*Serridentinus*)	Honshu (Rikuzen)			×	
**Trilophodon palaeindicus* Lyd.	Honshu (Mino)		×		
Parastegodon aurorae Mat. (*Stegodon*)	Honshu (Kaga)			×	
**Stegodon bonbifrons* Falc. and Caut.	Honshu (Kazusa)			×	
**Stegodon clifti* Falc. and Caut.	Honshu (Ise)			×	
**Stegodon orientalis* Owen	Honshu (Kazusa, Shimotsuke, Echigo, Suo), Nagasaki), Inland Sea				×
**Stegodon sinensis* Owen	Inland Sea				×
Stegodon sp.	Kyushu (Hyuga)		×		
Parelephas protomammonteus Mat. (*Palaeoloxodon*)	Honshu (Kazusa)			×	
**Parelephas trogontherii* Pohlig	Honshu (Kazusa, Mikawa, Omi, Shinano), Inland Sea.				×
Loxodonta tokunagai Mat. (*Palaeoloxodon*)	Honshu (Etchu)			×	
Loxodonta namadica naumanni Mak. 1924 (*Palaeoloxodon*)	Honshu (Musashi, Totomi, Sagami, Hitachi, Kazusa, Mikawa, Shimosa)				×
Elephas namadicus setoensis Mak. 1929 (*Palaeoloxodon*)	Inland Sea				×

[1]The names in parentheses are the generic references which will be used in Professor Henry Fairfield Osborn's forthcoming memoir on the Proboscidea.

LIST OF THE FOSSIL LAND MAMMALS OF JAPAN AND KOREA—*Cont.*

Specific Names	Locality	Oligocene	Miocene	Pliocene	Pleistocene
Loxodonta namadica yabei Mat.	Honshu (Ugo, Noto), Inland Sea, Shikoku, Hokaido (Ishikari)				×
Elephas indicus buski Mat.	Honshu (Musashi, Mino, Mutsu)				×
Mastodon, sp.	Korea (Joshin)		?	?	
PERISSODACTYLA					
Equidae					
Anchitherium hypohippoides Mat.	Honshu (Mino)		×		
**Equus caballus* Linné	Honshu (Hyogo), Korea (Keikido)				×
Tapiridae					
Palaeotapirus yagii Mat.	Honshu (Mino)		×		
Helaletidae					
Desmatotherium grangeri, sp. nov.	Korea (Kokaido) ×[1]				
Lophiodontidae					
Lophiodont	Korea (Kokaido) ×[1]				
Titanotheriidae					
Titanothere sp.	Hozan coal mine, Northwestern Korea ×[1]				
Rhinocerotidae					
Teleoceras pugnator Mat.	Honshu (Mino)		×		
Rhinoceros (*Teleoceras*) *tokiensis* Tok.	Honshu (Mino)		×		
Rhinoceros (*Teleoceros*?) *kaniensis* Tok.	Honshu (Mino)		×		
Rhinoceros (*Aceratherium*?) *watanabei* Tok.	Honshu (Suo)		×		
Rhinoceros (*Aceratherium*?) *makii* Tok.	Korea (Kokaido)		×		
Rhinoceros sp.	Honshu (Suo)		×		
Rhinoceros shindoi Tok.	Honshu (Shimotsuke) Kyushu (Buzen)				×
Rhinoceros koreanicus Tok.	Korea (Keikido)				×
Rhinoceros sp.	Taiwan (Taikei)				×
ARTIODACTYLA					
Anthracotheriidae					
Brachypodus japonicus Mat.	Kyushu (Hizen)	×			

[1]Upper Eocene.

LIST OF THE FOSSIL LAND MAMMALS OF JAPAN AND KOREA—*Cont.*

Specific Names	Locality	Oligocene	Miocene	Pliocene	Pleistocene
Suidae					
Sus nipponicus Mat.	Honshu (Ugo)				×
Sus leucomystax Tem.	Honshu (Shimotsuke), Kyushu (Buzen)				×
Cervidae					
Amphitragulus minoensis Mat.	Honshu (Mino)		×		
Dicrocerus tokunagai Mat.	Honshu (Iwaki)		×		
Cervavus oweni hirabayashii Tok.	Honshu (Shinano)		×		
Cervus nippon nippon Tem.	Honshu (Musashi, Shimotsuke, Ugo), Kyushu (Buzen), Inland Sea				×
Cervus kazusensis Mat.	Honshu (Kazusa)				×
Cervus riukiuensis Mat.	Loochoo Is.				×
**Cervus* cfr. *elaphus* Linné	Korea (Heian-nando)				×
Cervus sp.	Honshu (Shimoosa)				×
Cervus sp.	Honshu (Totomi)			?	
Cervus sp.	Honshu (Sagami)			?	
**Elaphurus davidianus* M–Edwards	Honshu (Kazusa)				×
Muntiacus astylodon Mat.	Loochoo Is.				×
Giraffidae					
Giraffa nipponica Mat.	Honshu (Kazusa)				×
Bovidae					
Bubalina sp.	Honshu (Omi)			×	
**Bison occidentalis* Lucas	Inland Sea				×
**Bibos geron* Mat.	Inland Sea				×

EOCENE MAMMALS FROM KOREA

In Kokaido, the northwestern part of Korea, there have been deposited Tertiary strata, in which the Hozan coal seams are found and at the present time coal-mining operations are in progress. The thickness of the principal seam is about 25 feet. The latter is interveined with four or more thin partings and lies near the base of the Tertiary of the region, being separated by only 20–30 feet from the underlying Palaeozoic limestone. Sandy shales with molluscan fossils such as *Mya* and others are found overlying the seam. Because of the scarcity of fossils,

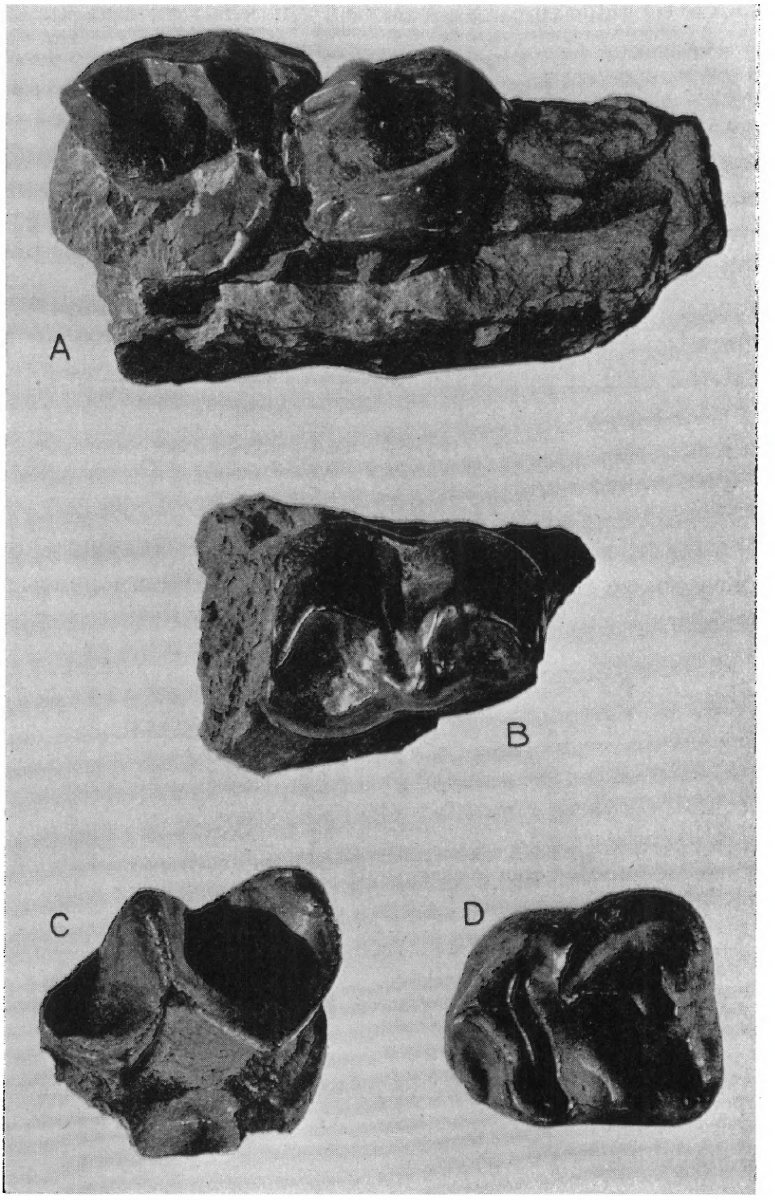

Fig. 1.—A. Titanothere, P^{2-3} right; B. Titanothere, M_1(?) left; C. Titanothere, M^3(?) right. All natural size. D. Lophiodont, P_4 right. Twice natural size.

the geological age of the coal-bearing strata had not hitherto been determined. In 1930 the author visited this district, and fortunately collected a number of mammalian remains, securely imbedded in the coal. Mostly they are fragments, but they are very important as they determine the approximate geological age of this horizon.

The more noteworthy of these fossils are the teeth of a titanothere, a jaw fragment of *Desmatotherium* and various teeth of the Rhinocerotidae (provisionally named as *Rhinoceros makii* in the present list) and some lophiodont animal (see Fig. 1).

Among the numerous fragments of the teeth of titanotheres, the author found the following specimens which probably belong to one individual and some of which are shown in Fig. 1 of this paper:

Right lower canine.
Right upper second and third premolars, and second molar.
Left upper third premolar.
Lower third premolar and third molar.

Excepting these isolated teeth, other portions of the skull were entirely broken, so it is too hazardous to assign even a generic name to the present specimens.

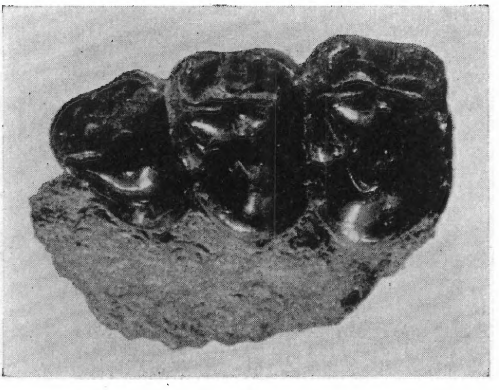

Fig. 2.—*Desmatotherium grangeri*, sp. nov. Type specimen. Fragment of left maxilla with P^2–P^4. From the Upper Eocene coal measures of northwestern Korea. Seven-fourths natural size.

Desmatotherium grangeri, sp. nov.

TYPE.—A fragment of the left maxilla with P^2–P^4 well preserved. From the collection of Professor Shigeyasu Tokunaga of Waseda University, Tokyo, Japan.

HORIZON AND LOCALITY.—From the Upper Eocene Hozan coal deposit. Kokaido, northwestern Korea. Collected by Professor Shigeyasu Tokunaga.

DIAGNOSIS.—Size approximately that of *D. mongoliense* from the Irdin Manha beds of Mongolia but differing from both that species and from *D. fissum*, also from

the Irdin Manha beds, by the greater simplicity and less quadrate character of the premolars. P^2 and P^3 with a single interior cusp and triangular in outline. P^4 with two inner cusps placed close together and separated by shallow groove on the lingual face of the tooth; subquadrate in outline. Enamel crown relatively low, 5 mm. in the present species and 6 mm. in *D. mongoliense*, measured on the lingual face of the teeth.

The species is readily distinguished from the Mongolian forms, especially in the P^2 and P^3 which in the latter species are distinctly quadrate four-cusped teeth. In the P^4 the resemblance to *D. mongoliense* and *D. fissum* is closer. *D. grangeri* is the most primitive of the three Asiatic species known and may possibly come from a horizon a little older than Irdin Manha, although this is not probable.

MEASUREMENTS OF *Desmatotherium grangeri*

P^2–P^4		=25.5 mm.
P^2	antero-post.	= 8.
P^2	transverse	= 9.
P^3	antero-post.	= 8.5
P^3	transverse	=11.
P^4	antero-post.	= 9.
P^4	transverse	=12.

Although the specimens of titanothere are not so perfectly preserved, yet the associated discovery of *Desmatotherium* in Korea surely proves a close connection of mammalian faunas in Korea and Mongolia in Upper Eocene time.

By means of the above-mentioned data we can say that the Hozan horizon, of Korea belongs to the Upper Eocene and is probably correlated with either the Irdin Manha or Shara Murun formations of Mongolia.